THE EU MARKET FOR PAPAYA

Market Survey #06

INTRODUCTION

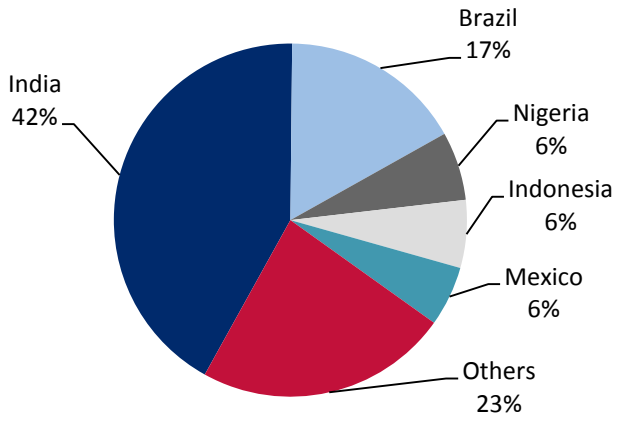
Papaya, *Carica papaya*, also called Paw Paw (Australia) or Mamao (Brazil), is an exotic fruit native to southern Mexico and neighboring Central America. Today it is widely distributed throughout the tropical and warmer subtropical areas of the world, making it available year round. Ripe papayas are popular as breakfast or dessert fruit, and can be used to make fruit salads, refreshing drinks, jam, jelly, marmalade, candies, and crystallized fruits. Papayas are also grown for the extraction of papain, an enzyme that can break down proteins. Accordingly, papain has varied uses in the beverage (chill-proofing beer), food (meat tenderizer), and pharmaceutical industries (drug preparations for digestive ailments).

In general, there are two types of papayas: Hawaiian and Mexican. The "Solo" papaya is the commercially dominant Hawaiian variety and generally weighs about one pound. Due to its size, Solo papayas are often marketed to retail supermarket chains since they are small enough for an individual to eat whole (hence the name Solo). In Mexico, "Maradol" papayas are the commercially dominant variety and weigh two to five pounds. Maradols are not as sweet as Hawaiian papayas, but are typically cheaper and are marketed to both retail markets and the food service industry (i.e. major restaurants and hotel chains). In Brazil, "Formosa" papayas are a variety similar to Maradols, but are more uniform in size and shape and can weigh up to six pounds. Due to their large size, these papayas are primarily marketed to the food service industry. Hybrids exist such as the Brazilian "Calimosa," which is a crossing of Solo and Formosa.

PRODUCTION

From 2005-2010, global fresh and dry papaya production increased from approximately eight million metric tons (MT) to 11.2 million MTs. Increase in Indian production largely explains this growth, recording a production increase of 2.1 million MTs to 4.7 million MT (or 120% domestic increase) over the same period. Accordingly, India was the top producer and accounted for 42% of global production in 2010. Brazil was the second largest producer with 1.87 million MTs produced, followed by Nigeria at 700,000 MTs, Indonesia at 700,000 MTs and Mexico at 620,000 MTs. The remaining 2.6 million MTs or 23% of 2010 production was comprised of 55 nations, illustrating the wide area under which papaya is cultivated. Kenya was among this group, cultivating 85,700 MTs in 2010. EU production is limited to the Spanish Canary Islands and amounts to only a few MTs per year.

Figure 1: World Production of Papayas (Fresh/Dry)
Share by Volume, 2010



Source: FAOStat

Total: 11.2 million MTs

MARKET

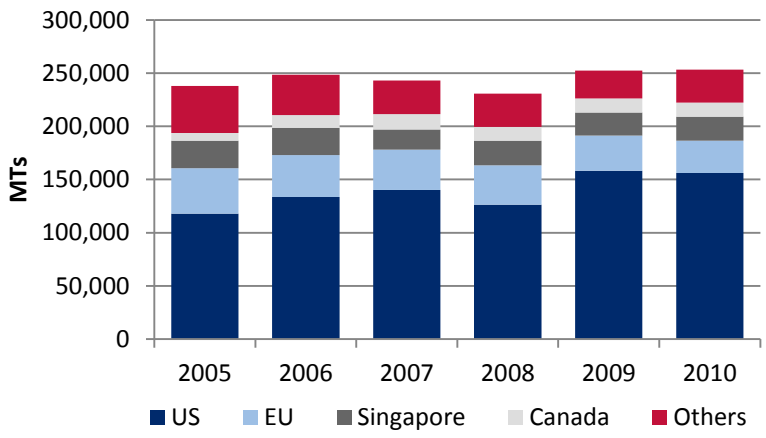
Papaya is primarily traded in its fresh form, with dry papaya accounting for miniscule share of imports in terms of volume.[1] In total, the global import market for both fresh and dry papayas has steadily increased from 2005-2010, rising from approximately 238,000 MTs to 253,000 MTs (UN Comtrade, USDA-GATS, and Eurostat). The **US** dominated the import market throughout the period and accounted for 156,248 MTs or 62% of the world's fresh/dry imports in 2010.

The **EU** was the second largest market totaling 30,262 MTs or 12% of all imports, followed by **Singapore** at 22,503 MTs (9%) and **Canada** at 13,462 MTs (5%). The US and Canada were markets of growth with net import increases of 33% and 85% from 2005-2010, respectively. The Canadian market is a relatively new market for papaya and in January 2003, the Canadian government approved the importation of genetically modified papayas, bolstering imports. Canadians prefer Solo Sunrise and other red-flesh papaya varieties. The US market rose in part to its growing immigrant population (from Asia, Latin America, and the Caribbean), as well as increased awareness of the fruit's health benefits.

The EU and Singapore were markets in decline with net import decreases of 29% and 13% over the same period, respectively. In 2005, **China** (including Hong Kong and Macao) was the third largest market, importing approximately 27,000 MTs or 11% of all fresh/dry imports. By 2010, China's market share declined to roughly 8,200 MTs representing just 3% of the market. China's decline, as well as the US's rise, can be partially linked to their domestic production. According to FAOStat, from 2005-2010, China's papaya production increased from 118,475 MTs to 131,100 MTs, while equivalent US figures declined from 14,920 MTs to 13,650 MTs.

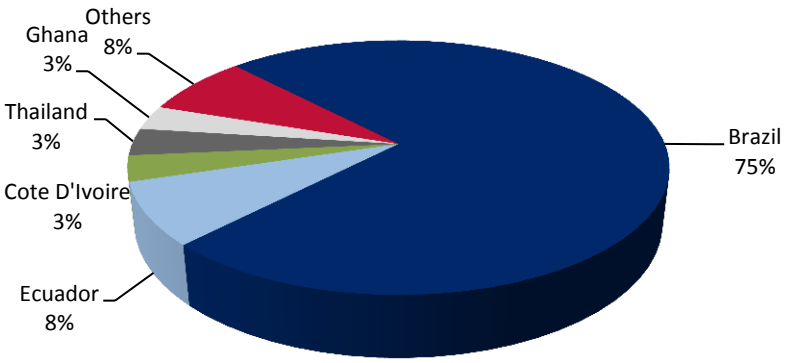
The **EU** is the second largest market for papayas and is reliant on imports for consumption. In spite of its lack of domestic production, from 2005-2010, EU imports decreased from 42,716 MTs valued at $64.2 million (USD) to 30,262 MTs worth $71.4 million. Within the EU, the **Netherlands** was the top importer of fresh papayas, but mainly re-exports the

Figure 2: World Imports of Papayas (Fresh/Dry)



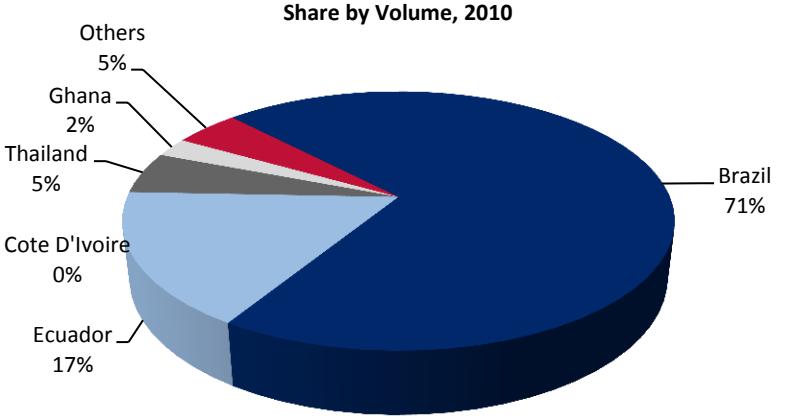
Source: UN Comtrade, USDA-GATS, Eurostat

Figure 3: EU Imports of Papayas (Fresh/Dry)
Share by Volume, 2005



Source: Eurostat

Figure 4: EU Imports of Papayas (Fresh/Dry)
Share by Volume, 2010



Source: Eurostat

[1] In 2010, for the US and EU, dry papayas accounted for approximately 2 percent of imports in terms of volume. US dry imports totaled 2,357 MTs out of ~156,000 MTs imported (fresh/dry), while EU dry imports totaled 712 MTs out of ~30,000 MTs. (USDA-GATS, Eurostat)

fruit to other EU countries (88% of imported papaya is re-exported). As a supplier to Europe, declining Dutch imports (17,000 MTs to 6,000 MTs or -64% from 2005-2010) were the major reason behind the overall drop in EU imports. The import decline has been attributed to poor economic conditions, which adversely effects the relatively unknown and high priced papaya. The majority of Dutch imports originate from Brazil and Ecuador.

The **United Kingdom** has traditionally been the EU's second largest importer of fresh papayas, but steadily decreasing imports (8,675 MTs to 4,541 MTs or -48% over the same period) made the UK the fifth largest importer in 2010. In contrast to the Netherlands, the UK has a strong domestic market due to its large ethnic communities. Poor economic conditions have dampened demand for the fruit. The UK imports from a wider variety of countries than any other EU country, with Brazil as the lead supplier, followed by Pakistan, India, and Egypt.

As a result of the UK's decline, **Portugal** emerged in 2010 as the number two EU buyer with 5,076 MTs imported in 2010. From 2005-2010, the Portuguese market was relatively stable and recorded a slight import increase of 3% in terms of volume. The vast majority of imports arrive from Brazil, with small amounts coming from Ecuador. **Spain** was just behind Portugal as the third largest importer at 5,012 MTs in 2010, a 51% increase from 2005. The relative robustness of the Iberian market (i.e. Spain and Portugal) has been partly attributed to the countries' historical relations with the papaya producing countries of Brazil and Ecuador.

Germany is another large market for papaya in the EU. The availability of papaya has gradually increased over the years, with imports rising from 3,481 MTs to 4,606 MTs (or by 32%) from 2005-2010. Brazil and Ecuador were the primary suppliers of fresh papaya. Germany and **Denmark** are the primary EU importers of dried papaya from Thailand.

In general, the EU market has shown increased demand for processed, semi-processed, and prepared papaya (fruit juice, preserves, and peeled/sliced papaya). In addition, EU consumers prefer the smaller Solo variety that serves as a single portion.

Table 1: EU Imports of Papaya (Fresh/Dry)

Suppliers	2005		2006		2007		2008		2009		2010	
	MTs	$000s	MTs	$000s	MTs	$000s	MTs	$000s	MTs	$000s	MTs	$000s
Brazil	31,855	$47,347	26,942	$45,493	24,660	$51,625	23,288	$56,741	20,556	$48,817	21,514	$54,122
Ecuador	3,387	$2,208	4,078	$3,256	4,740	$3,349	3,661	$3,495	5,230	$5,241	5,070	$5,829
Cote D'Ivoire	1,398	$2,782	1,857	$3,633	1,806	$2,961	3,574	$3,518	1,061	$929		
Thailand	1,477	$3,483	1,829	$5,086	1,858	$6,595	2,080	$7,688	1,658	$6,183	1,573	$6,442
Ghana	1,334	$2,515	1,223	$2,882	1,056	$2,638	1,061	$2,549	798	$1,905	726	$1,766
Others	3,266	$5,890	3,310	$6,204	3,660	$7,475	3,481	$7,364	3,983	$7,799	1,379	$3,292
Total	**42,716**	**$64,225**	**39,238**	**$66,554**	**37,780**	**$74,642**	**37,143**	**$81,355**	**33,286**	**$70,874**	**30,262**	**$71,451**

Source: Eurostat HS Codes: CN8 08072000 and 08134050

SUPPLIERS

India is the leading producer of papaya. In 2010, the country accounted for 42% of global production in terms of volume. Despite its status as the world's largest producer, India exports less than 1% of its production and comprises just 3-6% of global exports in terms of volume. The country has a high domestic demand for the fruit owing to the country's rising population, increasing per-capita incomes and growing trend towards healthier food consumption.

Mexico is world's largest exporter of papayas and accounted for 47% of all fresh/dry exports by volume in 2010 (UN Comtrade). Mexico primarily exports Maradol papayas to the US. From 2005-2010, Mexican exports to the US rose from 80,182 MTs valued at $60.9 million to 115,214 MTs valued at $65.9 million. Canada is Mexico's next largest buyer, with imports rising from 112 MTs valued at $90,348 to 900 MTs valued at $524,883 over the same period.

Brazil is the world's second largest papaya producer and the number one supplier to the EU market. From 2005-2010, Brazilian exports to the EU declined from 31,855 MTs valued at $47.3 million to 21,514 MTs valued at $54.1 million (Eurostat). Brazil's decline mirrored the overall decrease in EU imports of papaya. Brazil is also a secondary supplier to the US, exporting 2,984 MTs valued at $4.3 million in 2010. Brazil produces Solo, Maradol, and Formosa varieties of

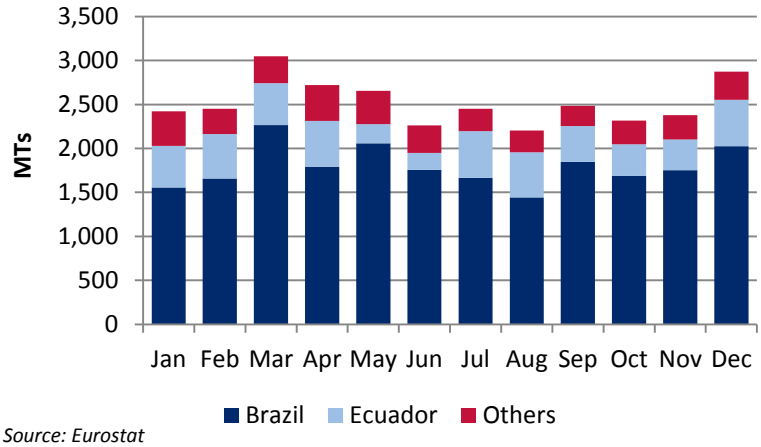
papaya. For the EU market, Solo and Formosa are supplied, while the US market mainly receives Solo papayas and small amounts of Maradol. The Brazilian climate is such that the country is able to supply papayas year round. In 2011, heavy rains caused concerns that rising humidity levels would cause disease among plantations. According to the president of the Brazilian Association of Papaya Exporters (BRAPEX), humid soil increases the likelihood of fungal attacks and could cause sudden crop loss.

Ecuador is the second largest supplier to the EU market with production concentrated in the country's mountain valleys. From 2005-2010, Ecuadorian exports to the EU increased from 3,387 MTs valued at $2.2 million to 5,070 MTs valued at $5.8 million. The country produces both Hawaiian varieties and the Mexican Maradol variety.

Cote D'Ivoire was the third largest supplier to the EU market up until 2008. By 2010, EU imports from the West African country dropped to zero. According to a report published in February 2010 by the International Trade Center Market News Service, erratic supply due to poor sales and disease caused the decline. However, the country intends to re-launch production, especially of the Solo variety, in order to increase regional exports and processing.

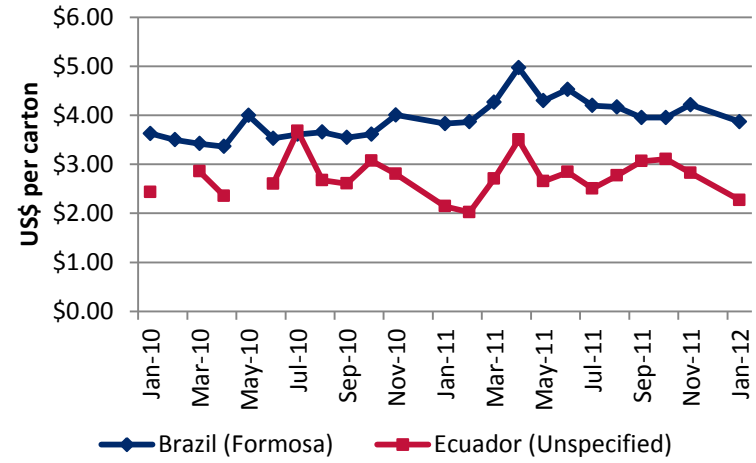
Kenya is a secondary producer of papaya, cultivating 85,700 MTs in 2010. Pawpaw (the Kenyan name for papaya) exports are negligible and decreased from 10 MTs to 1.8 MTs from 2005-2010. Most of the commercial varieties grown in Kenya are derived from Hawaiian varieties.

Figure 5: EU Monthly Imports of Papaya (Dry/Fresh), 2010



Source: Eurostat

Figure 6: EU Import Prices for Papayas (USD per 3.5-4 kg carton)
Formosa and Unspecified Varieties



Source: ITC-MNS

SEASONALITY

EU imports are not seasonal and typically range from 2,000 MTs to 3,000 MTs per month. Domestic EU production is limited to the Canary Islands, where in 2011, the Spanish archipelago exported a test shipment of 10 MTs to the EU. The islands intend to annually supply 1.5 MTs (per country) to Portugal and Peninsular Spain, and later to the Netherlands and Germany.

PRICES

Papayas are highly price sensitive because they are traded in small volumes and supply is inconsistent. In general, Solo papayas fetch higher price per unit than Maradol and Formosa papayas due to the former's sweeter flavor and more appealing presentation.

From January 2010 to January 2012, EU prices for Brazilian Formosa papayas increased from $3.62 per carton (each carton is about 3.5-4 kilograms or 8 pounds) to $3.86 per carton. In general, three to four Formosa papayas are shipped in each 3.5-4 kg carton. EU prices for Ecuadorian papayas (varieties unspecified) decreased from $2.43 per carton to $2.26 per carton. In Figure 5, Brazilian Formosa papayas were mainly shipped by air because of its fragility, while all Ecuadorian papayas (varieties unspecified) were shipped by sea. Please note air transport is generally more expensive than sea shipments. Overall, EU import prices have remained relatively stable since 2010, with the exception of higher prices in mid-2010 due to the eruptions of Eyjafjallajökull (Icelandic volcano), which disrupted air shipments.

STANDARDS, LAWS, AND REGULATIONS

Tariff and Trade: EU imports of fresh and dried papaya have a 0% and 2% general tariff rate, respectively. However, Kenya qualifies for a 0%tariff rate for both forms due to the interim Economic Partnership Agreements (EPA) initiated in 2007.

Grades and Standards: There are three quality classes: Extra class, Class I, and Class II (Codex Alimentarius Standard for Papaya[2]):

Extra Class

Papayas in this class must be of superior quality. They must be characteristic of the variety and commercial type. They must be free of defects, with the exception of very slight superficial defects, provided these do not affect the general appearance of the produce, the quality, the keeping quality, and presentation in the package."

Class I

Papayas in this class must be of good quality. They must be characteristic of the variety and/or commercial type. The following slight defects, however, may be allowed, provided these do not affect the general appearance of the produce, the quality, the keeping quality, and presentation in the package:

- Slight defects in shape;
- Slight skin defects (i.e. mechanical bruising, sun spots and/or latex burns). The total area affected shall not exceed 10% of the total surface.

The defects must not, in any case, affect the pulp of the fruit.

Class II

This class includes papayas which do not qualify for inclusion in the higher classes, but satisfy the minimum quality requirements. The following defects, however, may be allowed, provided the papayas retain their essential characteristics as regards the quality, the keeping quality, and presentation:

- Defects in shape;
- Defects in coloring;
- Skin defects (i.e., mechanical bruising, sun spots and latex burns). The total area affected should not exceed 15% of the total surface;
- Slight marks caused by pests.

The defects must not, in any case, affect the pulp of the fruit.

The majority of **EU** food retailers require GlobalGAP certification.[3] GlobalGAP is a private sector organization based in Europe that sets voluntary standards for the certification of agricultural products around the globe. The GlobalGAP standard addresses retailer and consumer concerns over environmental impact, food safety, and worker welfare.

For a full list of Maximum Residue Limit Requirements (MRLs) for papaya shipments to the US, EU, and the rest of the world (which uses CODEX as the default standard), please refer to Table 3 located in the "Annex" section of this report.

Packaging: EU imports of papayas are typically shipped in 3.5-4 kg (~8 lb.) cartons, containing anywhere from 3-10 pieces of fruit depending on the variety. Imports of Formosa papayas are also sometimes shipped in 4.5-9kg (~10-20 lb.) cartons. The contents of each carton must be uniform and contain only papayas of the same origin, variety/commercial type, quality, and size. The fruits are usually wrapped individually in paper or expanded polystyrene protection to prevent them from bruising each other.

Postharvest Handling: Papayas are ready to harvest when most of the skin is yellow-green, but dark green fruit will not ripen properly off the tree, even though it may turn yellow on the outside. Mature fruits can be stored at 50°F–55°F (10°C–12°C) for about 3 weeks; their chill point is 44°F (6.6°C) and they must be stored with no top ice and without being sprinkled with water. They have a high moisture loss rate (greater than 1.4%daily) and a high ethylene emission rate. Their optimal humidity for storage is between 85 and 95 percent. For fruit fly control purposes, papayas have to be dipped in hot water for 20 minutes at 49°C (120.2°F).

[2] CODEX STAN 183-1993: www.codexalimentarius.net/download/standards/314/CXS_183e.pdf
[3] Global GAP: http://www.globalgap.org/cms/front_content.php?idcat=9

OUTLOOK

In 2010, the **EU** import market for fresh and dried papaya totaled 30,262 MTs, a significant decline from 42,716 MTs imported in 2005. In general, Brazil is the largest EU supplier, followed by Ecuador as a secondary supplier. In 2012, supply from Brazil may suffer due to high humidity and heavy winter rains, which damaged papaya crops in the major production regions of Bahia and Sao Paulo, eastern Brazil. In early January 2012, a local agronomist noted that papaya trees were suffering from *Phytophthora* fungal outbreaks and that entire crops were lost in some areas (no specific figures given). A poor Brazilian harvest would push prices up and require EU buyers to supplement their imports from other countries. Together with Cote D'Ivoire's 2009 withdrawal as an EU supplier, Kenya could have a good opportunity as a secondary supplier to increase its imports to the EU.

Complicating matters is EU demand for the fruit. Prior to 2000, papaya was a relatively unknown exotic fruit in the EU and scarcely available. Consequently, the demand for papayas follows the rules that apply broadly to all lesser known fruit; when economic conditions deteriorate, the market for the relatively high priced papayas will also decline. This fact was reflected in EU fresh papaya imports, which shrunk during the 2008-2010 global economic recession from 35,972 MTs to 29,550 MTs.

To bolster demand, the Brazilian Association of Papaya Exporters (BRAPEX) and Brazilian Fruit Institute (IBRAF) have been actively promoting papaya within the EU through various informational campaigns including international fruit fairs and free papaya tastings. In mid-2011, papaya tastings were held in London at various stores of four major UK supermarket outlets. Brazilian papaya exporters are also attempting to penetrate a wider EU market by selling directly to Spain, Portugal, France, Germany and the UK. Traditionally, papaya exports were routed through Rotterdam, Netherlands and later re-exported to other EU member countries. Kenya could take advantage Brazilian promotional campaigns and strategies, by direct selling to the UK market, which was the second largest EU market until 2010. Kenya may be able to out-compete Brazil, as Kenya has strong historical and economic ties with the UK. Within the UK, as elsewhere in the EU, the papaya trade is not dominated by large multinational companies, but instead by independent specialized importers. For Kenyan producers, UK importers operating in African communities would be an ideal market to supply.

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ANNEX

Table 2: Maximum Residue Limits (MRLs) for Papayas

	US	EU	CODEX
Azoxystrobin	2	*{0.3}*	*{0.3}*
Bifenazate	7	*{0.01}*	---
Boscalid	1.5	*{0.05}*	---
Buprofezin	0.9	*{0.05}*	---
Carfentrazone-ethyl	0.1	*{0.01}*	---
Chlorantraniliprole	2	*{0.01}*	---
Chlorothalonil	15	20	20
Cyprodinil	1.2	*{0.05}*	---
d-Phenothrin	0.01	0.05	---
Diuron	0.5	*{0.1}*	---
Etoxazole	0.2	*{0.02}*	---
Fenbutatin-oxide	2	*{0.05}*	---
Fenpropathrin	1	*{0.01}*	---
Fludioxonil	0.45	*{0.05}*	---
Glyphosate	0.2	*{0.1}*	---
Imidacloprid	1	*{0.05}*	---
Inorganic bromide resulting from fumigation with methyl bromide	20	50	20
Malathion	1	*{0.02}*	---
Mancozeb	10	*{7}*	*{5}*
Maneb	10 Time-limited	*{7}*	*{5}*
Metalaxyl	0.1 Regional	*{0.05}*	---
Metalaxyl-M (Mefenoxam)	0.4	*{0.05}*	---
Methoxyfenozide	0.6	1	1
Myclobutanil	3	*{0.02}*	---
Oryzalin	0.05 Regional	*{0.01}*	---
Oxyfluorfen	0.05 Regional	0.05	---
Paraquat dichloride	0.05	*{0.02}*	*{0.01}*
Permethrin	1 Regional	*{0.05}*	---
Phosphine	0.01	0.05	---
Pyraclostrobin	0.6	*{0.05}*	*{0.05}*
Pyridaben	0.1	0.5	---
Pyriproxyfen	1	*{0.05}*	---
Spinetoram	0.3	*{0.05}*	---
Spinosad	0.3	0.5	---
Spirodiclofen	1	*{0.03}*	*{0.03}*
Spirotetramat	2.5	*{0.4}*	---
Thiabendazole	5	10	10
Thiamethoxam	0.4	*{0.05}*	*{0.01}*
Trifloxystrobin	0.7	1	---
Triflumizole	2.5	*{0.1}*	---

Source: USDA FAS Online http://www.mrldatabase.com/

MRL values in Red Italics are more restrictive than US

All numeric values listed are in parts per million (ppm), unless otherwise noted

--- (dashes) indicate no specific MRL for the commodity